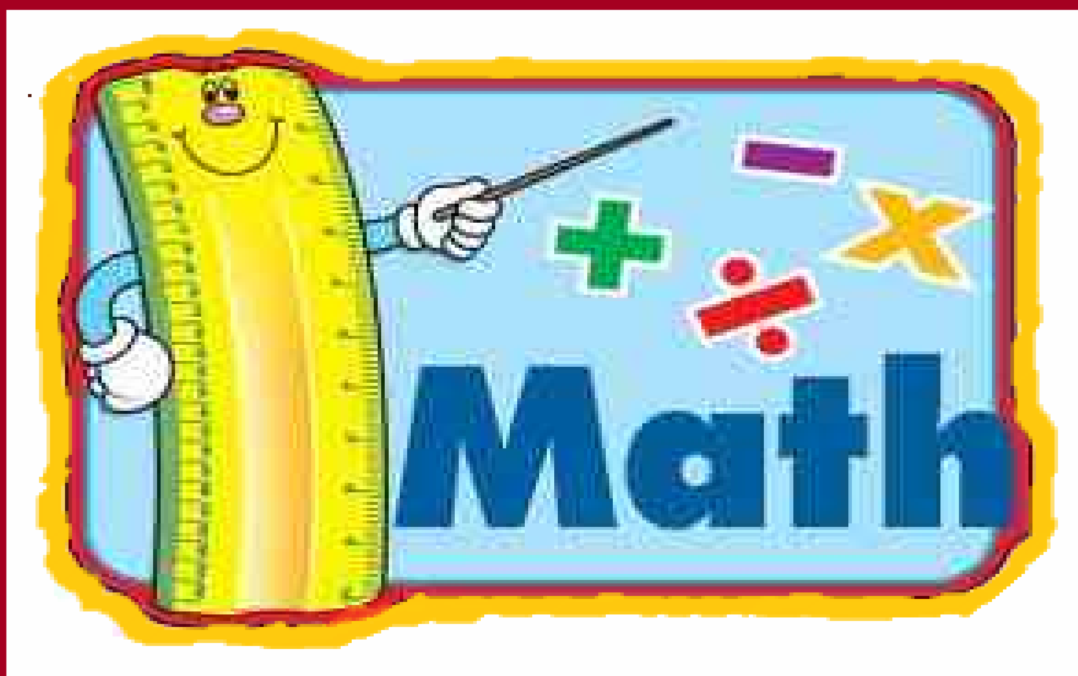


Algebra

2nd prep

2012-2013

1st - term

Unit 1

Real Numbers

Date:..................... **Sheet (1)**

SAMA Language School

Revision

1) Write the following numbers in the form $\frac{a}{b}$ where a and b are two integers, b ≠ zero and there aren't common factors between them.

a) 0.2 = ... b) 0.5 = ... c) 75% =..........

d) |-0.125| = ... e) - 5 = ... f) $1\frac{1}{4}$ =............

2) Choose the correct answer:

a) The solution set of the equation $x + 3 = |-3|$ in N is ....

({ 0 } or {6} or {-6}, Ø)

b) The rational number lies between $\frac{3}{8}$, $\frac{5}{8}$ is ....

($\frac{1}{4}$ or $\frac{3}{4}$ or 0.5 or - 0.5)

c) The product of the rational number a/b by its additive inverse is .....

(zero, - a/b or a^2/b^2 or $-a^2/b^2$)

d) |-2| + |-4| + |6| = ... (zero or |-12| or -12,or 6)

e) $\sqrt{a^2}$ = ... (a or -a or |a| or ±a)

3) Find the value of x which satisfies each of the following equations.

a) $3x - 7 = 20$

....

....

....

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b) $5\ \boldsymbol{x} + 21 = 13$

……………………………………………………

……………………………………………………

……………………………………………………

c) $3\ \boldsymbol{x} - 8 = 1$

……………………………………………………

……………………………………………………

……………………………………………………

d) $-\ \boldsymbol{x} + 3 = 7$

……………………………………………………

……………………………………………………

……………………………………………………

4) Complete:

a) The standard form of 0.00015 is ....

b) $\sqrt{(-a)^2}$ = ...

c) 0.16 + |-6| = ...

d) $2^0 + 2^1 + 2^2 + 2^3$ = ...

e) The sum of the two square roots of the number $2\frac{1}{4}$ = ...

Date:............ **Sheet (2)** SAMA Language School

The cube root of a rational number

Remember that :

- $\sqrt[3]{a^n} = a^{\frac{n}{3}}$
- If $x^3 = a$, then $x = \sqrt[3]{a}$

Ex: * $\sqrt[3]{a^6 b^{12}} = a^{\frac{6}{3}} b^{\frac{12}{3}} = a^2 b^4$

* $\sqrt[3]{8} = 2$

* $\sqrt[3]{-8} = -2$

$\sqrt[3]{0} = 0$

1) Choose the correct answer:-

a) $\sqrt[3]{(-8)^2}$ =...................... (2 , -2 , 4 , -4)

b) $\sqrt{25}+\sqrt[3]{-125}$ =.................. (10, 0 , 5,± 5)

c) $\sqrt[3]{3\frac{3}{8}} + \sqrt{0.25}$ =.................. ($\frac{3}{2}$, $\frac{1}{2}$, 2 ,-2)

d) $\sqrt[3]{1000} \times \sqrt[3]{-0.08}$ =.................... ($\frac{1}{2}$, 10 , 2 , -2)

e) $\sqrt[3]{X^6}$ =............................... (X^3 , X^2 , X , X^4)

f) The lateral area of a cube whose volume is 216 cm^3 =.............cm^2

(36 , 6 , 144 , 216)

2) Complete:

a) $\sqrt[3]{-27}$ = ...

b) $\sqrt[3]{216}$ = ...

c) $\sqrt[3]{1} + \sqrt[3]{-1}$ = ...

d) $\sqrt[3]{0.125}$ = ...

e) $\sqrt[3]{64} - \sqrt[3]{125}$ = ...

f) $\sqrt[3]{0.008}$ = ...

3) Complete :

a) $-\sqrt{4} = \sqrt[3]{....}$

b) If $x^3 = 64$, then $\sqrt{x}$ = ...

c) $\sqrt{25} = \sqrt[3]{....}$

d) $\sqrt{x^6 y^{12}}$ = ...

e) $\sqrt[3]{x^6 y^{12}}$ = ...

f) 35% from 160 = ...

g) $\sqrt{\frac{36}{....}} = 0.6$

h) $\sqrt[3]{.....} = -3$

i) If $(x , y) = (\sqrt[3]{0.064} , \sqrt{0.25})$ then x = ... , y = ...

4) Find the value of x in each of the following:

a) $\sqrt[3]{x} = 5$

....

....

....

b) $\sqrt[3]{x} = -3$

....

....

....

c) $\sqrt[3]{x} = 0.25$

....

....

....

d) $\sqrt[3]{x} = -\sqrt{4}$

....

....

....

e) $\sqrt[3]{x} - 3 = -1$

f) $\sqrt[3]{x^6} = 49$

....

....

....

....

....

....

5) Find the S.S in Q :

a) $x^3 = 64$

b) $x^3 + 5 = 32$

....

....

....

....

....

....

c) $2x^3 = 54$

d) $x^3 + 125 = 0$

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....

e) $8x^3 = 27$

f) $x^3 - 1 = 7$

....

....

....

....

....

....

g) $\frac{1}{5}x^3 = -200$

h) $2x^3 - 5 = x^3 + 3$

....

....

....

....

....

....

i) $12x^2 + 3\frac{1}{4} = 40$

j) $\frac{1}{3}x^3 = 41\frac{2}{3}$

k) $(x + 3)^3 = 343$

l) $(5x - 2)^3 + 10 = 18$

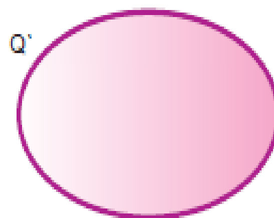
6) Find the side length of a cube vessel with capacity of one liter.

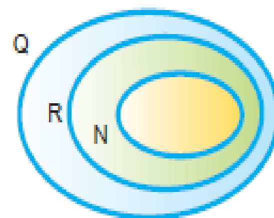
7) The cube of a number equals 27. Find the square of the number.

8) Find the side length of a cube vessel with capacity of one liter?

The set of Irrational numbers Q`

Remember that :





$Q \cap Q` = \varnothing$

Set of irrational: Q'

It's the numbers which cannot be put in the form $\frac{a}{b}$

* Examples for elements form Q' : $\sqrt{2}$, $\sqrt{3}$, $\sqrt[3]{4}$, $\sqrt[3]{9}$, π, ...

1) Show if the number is rational or irrational :

a) $\sqrt{4}$ -----------   b) $\pi/2$ -----------

c) $\sqrt{1.21}$ -----------   d) $(-5)^0$ -----------

e) $\sqrt{7}$ -----------   f) $\sqrt{9} + \sqrt{16}$ -----------

g) zero -----------   h) $\sqrt[3]{24}$ -----------

2) a) Find two consecutive integers including the number $\sqrt{7}$ between.

....

....

b) Find Two consecutive integers including the number $\sqrt{5}$ between.

....

....

3) prove that :

a) $\sqrt{3}$ lies between 1.7 and 1.8

………

b) $\sqrt{11}$ lies between 3.31 and 3.32

………

c) $\sqrt[3]{15}$ is included between 2.4 and 2.5.

………

4) Choose the correct answer:

a) The volume of a cube whose edge length is 3 = ...

(27 , 9 , 12 or 6)

b) The irrational number lies between 2 and 3 is ....

(2.5 , $\sqrt[3]{9}$, $\sqrt{11}$ or $\sqrt{4}$)

c) The nearest integer to $\sqrt[3]{24}$ is .... (5 , 3 , 2 or 12)

d) The square whose area is 7 cm^2, its side length is .... cm

(3.5 , -3.5 , $\sqrt{7}$ or - $\sqrt{7}$)

e) The cube whose volume is 512 cm3 its side length is........ cm

(8 , 4 , 16 or 64)

f) $(\sqrt[3]{-3}\,)$3 =........... (3 , -3 , ±3 , $\sqrt[3]{-9}$)

g) The irrational number located between -2 and -1 is ....

(-3 , $-1\frac{1}{2}$, $-\sqrt{3}$, $\sqrt{2}$)

h) If $n \in z^+$, $n < \sqrt{26} <$ n+1 , then n=………………

(25, 5 , -5 , 24)

5) Find the value of x in each of the following cases and determine whether x ϵ Q or x ϵ Q`

a) $25\,x^2 = 9$

……………………………………………………

……………………………………………………

……………………………………………………

b) $2\,x^2 = 10$

……………………………………………………

……………………………………………………

……………………………………………………

c) $x^3 = 0.125$

……………………………………………………

……………………………………………………

d) $x^3 = 12$

……………………………………………………

……………………………………………………

e) $(x - 3)^2 = 4$

……………………………………………………

……………………………………………………

f) $(x - 5)^3 = 8$

……………………………………………………

……………………………………………………

6) Determine the point that represents each of the following numbers on the number line :

a) $\sqrt{3}$

b) $-\sqrt{5}$

c) $\sqrt{2} + 1$

d) $2 - \sqrt{7}$

7) Draw the number line then:

* label point A which represents $\sqrt{3}$

* label point B which represents ($1+\sqrt{3}$)

* label point C which represents ($1-\sqrt{3}$)

8)put (√) or (X):-

a) $2.3 \times 105 \in Q$ (   )

b) $|-5| \in Q'$ (   )

c) $\frac{0}{5} \in Q$ (   )

d) $\sqrt[3]{-4} \in Q'$ (   )

e) $\sqrt{1000} \in Q$ (   )

f) $\sqrt{7} > 3$ (   )

g) $\sqrt{10} > 2$ (   )

h) $\sqrt[3]{20} > \sqrt{9}$ (   )

i) The side length of a square whose area = 6 cm2, is a rational number (   )

9) If x is an integer , find the value of x in each of the following :-

a) $x < \sqrt{7} < x+1$

……………………………..

……………………………..

b) $x < \sqrt{80} < x+1$

……………………………

……………………………

c) $X < \sqrt{125} < x+1$

………………………………

………………………………

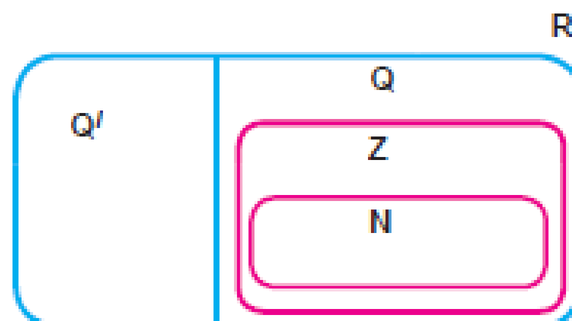
d) $x < \sqrt[3]{5} < x+1$

……………………………….

……………………………….

The set of the Real numbers R

Remember that :



$R = Q \cup Q'$

$N \subset Z \subset Q \subset R$

$R_+ = \{ X : X \in R , X > \text{Zero} \}$

$R_- = \{ X : X \in R , X < \text{Zero} \}$

$R_+ \cap R_- = \emptyset$

$R = R_+ \cup \{0\} \cup R_-$

$R_+ \cup \{0\} = \{ X : X \in R$,…………………….. } and it is

Called the set of …………………………..

$R_- \cup \{0\} = \{ X : X \in R$ ……………. } and it is
Called the set of ……………………….

$R^* = R - \{0\}$

1) Arrange the following numbers in a descending order:

a) $\sqrt{3}$, $-\sqrt[3]{9}$, 2 , $\sqrt{8}$

……

b) $\sqrt{75}$, $\sqrt{68}$, $-\sqrt{45}$, -8 , 7 and $-\sqrt{32}$

……

2) Prove that $\sqrt{5}$ lies between 2.1 and 2.2, then represent: $\sqrt{5}$, 2.1 and 2.2 on the number line.

………

………

………

3) Find the side length in a square whose area is 7 cm^2. Is the side length a rational number?

………

………

………

………

4) Find the side length in a cube whose volume is 729 cm^3. Is the side length a rational number?

………

………

………

5) Write three irrational numbers included between the two numbers 11 and 12 ?

………

………

6) Write three negative irrational numbers greater than - $\sqrt{6}$

………

………

5) Put the suitable notation(> or < or =) :

a) $\sqrt{3}$ …….. 2

b) $\sqrt{8}$ …….. 2.5

c) $\sqrt{5}$ …….. -2

d) $1+\sqrt{2}$ ……….. $\sqrt{3}$

e) $\sqrt[3]{-24}$ … -2

f) $\sqrt{7}$ ………… 2.

6) Complete :

a) $R_+ \cup R_-$ = ……

b) { X : $x \in R$, $x > 0$ } = ……

c) $Q \cup Q'$ = ……

d) $R_+ \cap R_-$ = ……

e) $(\sqrt[3]{-3})^3$ = ……

f) $\sqrt[3]{2\sqrt{4}}$ = ……

8) Choose the correct answer:-

1) R=……………

a) $Q \cup Q'$ b) $z_+ \cup z_-$ c) $R_+ \cup R_-$ d) $N \cup R_-$

2){ X : X $\in$ R , x < 0 } = ………

a) R_+ b) R_- c) Z* d) R

3) If X is a negative real number , then which of the following number is positive…….

a) X^2 b) X^3 c) $2X$ d) $\frac{X}{2}$

4) $(\sqrt{3} - 2)$ ………… $(2 - \sqrt{3})$

a) > b) < c) $\geq$ d) =

5) If $\frac{1}{a}$ and $\frac{a}{\sqrt{5}}$ are two real numbers included between 0 and 1 then a =……………………

a) -2 b) 1 c) $\sqrt{5}$ d) 2

6) If $X \in R_+$, $y \in R_+$ and if $X^2 > Y^2$, then ....

a) $X > Y$ b) $X < Y$ c) $X=Y$ d) $X \leq Y$

7) The s.s of the equation $X^2+1=0$ in R is ……………….

a) { -1 } b) {1 , -1 } c) {1 } d) $\emptyset$

Date:............ **Sheet (5)** SAMA Language School

Intervals

Remember that :

$R =] -\infty , \infty [$, $R_- =] -\infty , 0 [$, $R_+ =] 0 , \infty [$

1) Write down the following sets in the form of intervals, then represent them on the number line.

a) $X = \{ \boldsymbol{x} : \boldsymbol{x} \geq 2 , x \in R\}$

....

b) $X = \{ \boldsymbol{x} : \boldsymbol{x} < 1 , x \in R\}$

....

c) $X = \{ \boldsymbol{x} : \boldsymbol{x} > -5 , x \in R\}$

....

d) $X = \{ \boldsymbol{x} : \boldsymbol{x} \leq \sqrt[3]{-8} , x \in\}$

....

e) $X = \{x : 2 < x < 5 , x \in R\}$

....

f) $X = \{x : -2 \leq x < 3 , x \in R\}$

....

g) $X = \{x : 0 \leq x \leq 4, x \in R\}$

....

h) $X = \{x : -3 < x \leq -1 , x \in R\}$

....

i) $X = \{x : 0 < x \leq 3, x \in R\}$

....

j) $X = \{x : -1 \leq x \leq 2, x \in R\}$

....

k) The set of all the real numbers more than | -3 |

....

2) Complete using $\in$ or $\notin$:

a) 3 .... [-1, 3 [

b) -2 ....] -1, 3 [

c) 12 ....] 0, 1 [

d) 2 .... [1, 2 [

e) 4 .... [0, 5 [

f) $\sqrt[3]{-8}$ .... [-1, 2]

g) -|-5| .... [4, 6 [

h) 2.3 x 10^{-5} ....] 0, 1 [

3) Write down the interval represented by each of the following figures:





....





....

4) Choose the correct answer:

a) R = ...

1) $R_- \cap R_+$ 2) $R_- \cup R_+$ 3)] -∞ , ∞ [4) $Q \cap Q'$

b) R_- = ...

1)] -∞ , 0 [2)] 0 , ∞ [3)] -∞ , ∞ [4)] -∞ , 0]

c) R_+ = ...

1)] -∞ , 0 [2)] 0 , ∞ [3)] -∞ , ∞ [4) [0 , ∞ [

d) The set of non-negative real numbers = ...

1)] -∞ , 0 [2)] 0 , ∞ [3)] -∞ , ∞ [4) [0 , ∞ [

e) The set of non-positive real numbers = …………

1)] -∞ , 0]   2)] 0 , ∞ [3)] -∞ , ∞ [4) [0 , ∞ [

f) [2, 7] - { 2, 7 } = ………..

1) [1, 6]   2) ∅   3)] 2 , 7[4) { 0 }

g) [0, 5] ∪ [3 , 8[= ………….

1)] 3 , 5]   2)[3 , 5]   3) [0 , 8]   4)[0 , 8[

h) [1 ,5] ∩] -2 , 3] = …………….

1){ 1 , 3}   2)] 1 , 3[3) [1 , 3]   4)[1 , 3 [

i)]-1 , 2[- [1, 4] = ………….

1)] -1 , 1[2){-1 , 1}   3)] -1 , 1]   4)[-1 , 1]

5) Find the following by using the number line :

a) $[-1 , 4] \cap [2 , 5]$ = ……

………………………………………………

b) $] -2 , 3] \cap] 0 , 1 [$ = ……

………………………………………………………

c) $[-1 , 3 [\cup [0 , 5]$ = ………

………………………………………………

d) $] -2 , 3] \cup] 0 , 1 [$ = ……

………………………………………………………

e) $[-2 , 2] - [0 , 4]$ = ……

………………………………………………………

f) $[-2 , 4] \cap [2 , 6]$ = ……

………………………………………………………

g) $[2 , 4] -] 2 , 4 [$ = ……

………………………………………………………

h) $[-2 , 3] \cap [1 , 5 [$

………………………………………………………

i) $] -2 , 5] \cup \{ -2, 5 \}$ = ……

………………………………………………………

j) $] -\infty , -2] - \{ -2 \}$ = ……

………………………………………………………

k) $R_{+} \cap [-1 , 3]$ = ……

………………………………………………………

l) $] -\infty , 4 [\cup] 3 , \infty [$ = ………

………………………………………………………

m)] 3 , 5 [∪ { 3 , 5 } = ……

…………………………………………………………

n)] 3 , 5 [- { 3 , 5 } = ……

…………………………………………………………

o)] -∞ , 3] – [-4 , ∞ [= ……

…………………………………………………………

p)] -4 , ∞ [-] -∞ , 3] = ……

…………………………………………………………

q) R – [- 1 , ∞ [= ……

…………………………………………………………

r) R_- - [-3 , 1]

…………………………………………………………

6) If A = [-2 , 5] , B = [1 , ∞[, C = {-2, 5}, find each of the following using the number line:

a) A ∪ B

…………………………………………………………

b) A ∩ B

…………………………………………………………

c) A - B

…………………………………………………………

d) A - C

…………………………………………………………

e) A ∩ C

…………………………………………………………

f) B ∩ C

…………………………………………………………

g) A'

…………………………………………………………

h) B'

…………………………………………………………

7) If X= [-1 , 4] , Y = [3 , ∞ [, Z = { 3 , 4 } Find each of the following using the number line ?

a) X ∪ Y

b) X∩Y

....

....

....

....

c) X – Z

d) Y∩ Z

....

....

....

....

e) X - Y

f) Y - X

....

....

....

....

g) X'

h) Y'

....

....

Operations on the real Numbers

1) Complete the following to have a true sentence:

a) $8 + \sqrt{3} = \sqrt{3} +$ ....

b) $11 + (-11) =$ ....

c) the additive inverse for $\sqrt{5}$ is ....

d) $\sqrt{6} + (-\sqrt{6}) =$ ....

e) $(4 + \sqrt{5}) + (3 - \sqrt{5}) =$ ....

f) $\sqrt{2} + \sqrt{2} + \sqrt{2} =$ ....

g) $3 \times \sqrt{2} =$ ....

h) $\sqrt{7} \times \sqrt{7} =$...........

i) $7\sqrt{2} \times 3\sqrt{2} =$ ....

j) $\sqrt{11}\,(3 + \sqrt{11}) =$ ....

k) The multiplicative neutral in R is the number ....

l) The multiplicative inverse for $\sqrt{10}$ is ....

2) Choose the correct answer :

a) The multiplicative inverse of the number $\frac{\sqrt{5}}{5}$ is ....

$\left(\frac{1}{\sqrt{5}} , \sqrt{5} , \frac{-\sqrt{5}}{5} , \frac{1}{5} \right)$

b) The multiplicative inverse of $\frac{\sqrt{2}}{6}$ is ....

$\left(2\sqrt{3} , 3\sqrt{2} , \frac{1}{2\sqrt{3}} , \frac{1}{3\sqrt{2}} \right)$

c) The multiplicative inverse of the number $\frac{-\sqrt{3}}{6}$ is ....

($\frac{\sqrt{3}}{6}$, $\frac{-\sqrt{3}}{6}$, $2\sqrt{3}$, $-2\sqrt{3}$)

d) ($\sqrt{5}$ + $3\sqrt{5}$) ÷ $\sqrt{5}$ = ... ($3\sqrt{5}$, 3 , 5 , 4)

e) If $\boldsymbol{x} = \sqrt[3]{2} + 10$, and $y = \sqrt[3]{2} - 10$, then $(\boldsymbol{x} + y)^3$ = ...

(16 , 18 , 20 , 22)

f) The S.S of the equation $\boldsymbol{x}\,(\boldsymbol{x}^2 + 3) = 0$ in **R** is ....

({0} , Ø , {0 , $\sqrt{3}$} , {$-\sqrt{3}$, 0 , $\sqrt{3}$ })

3) Complete :

a) The multiplicative inverse of the number $\frac{2\sqrt{3}}{5}$ is $\frac{....}{6}$

b) The multiplicative inverse of the number $\frac{3}{\sqrt{3}}$ is $\frac{....}{\sqrt{3}}$

c) If a is additive inverse of the number b , then a + b = ...

d) If $a = \frac{6}{\sqrt{5}}$ and $b = \frac{\sqrt{5}}{6}$, then a x b = ...

e) If $\sqrt{x} = \sqrt{2} + 1$, then x = ...

f) If $\boldsymbol{x} = 3$ and $y = \sqrt{3}$, then $\left(\frac{\boldsymbol{x}}{\boldsymbol{y}}\right)^3$ in the simplest form = ...

g) If $\boldsymbol{x}(\boldsymbol{x} - 3) = 0$, then $\boldsymbol{x} \in \{ .... \}$

4) If $X = \sqrt{5} + 3$ and $Y = 1 - \sqrt{5}$, find the value of :-

a) X + Y

………………………………………………………… …………………………………………………………

………………………………………………………… …………………………………………………………

………………………………………………………… …………………………………………………………

b) X Y

………………………………………………………… …………………………………………………………

………………………………………………………… …………………………………………………………

Date:............ **Sheet (7)** SAMA Language School

Operations on the square Roots

Remember that:

1) $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}} = \frac{\sqrt{ab}}{b}$, where $b \neq 0$

Ex : $\sqrt{\frac{4}{5}} = \frac{\sqrt{4}}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{20}}{5}$

2) $(\sqrt{\mathbf{a}})^{\mathbf{n}} = \sqrt{\mathbf{a}^{\mathbf{n}}}$ (where $a \neq 0$)

Ex : $(\sqrt{3})^5 = \sqrt{3^5} = 3^2\sqrt{3} = 9\sqrt{3}$

3) $a\sqrt{b} = \sqrt{\mathbf{a}^2\mathbf{b}}$

Ex : $3\sqrt{\frac{1}{3}} = \sqrt{9 \times \frac{1}{3}} = \sqrt{3}$

$15\sqrt{\frac{1}{3}} = 5 \times 3\sqrt{\frac{1}{3}} = 5 \times \sqrt{9 \times \frac{1}{3}} = 5\sqrt{\frac{1}{3}}$

4) $(a + b) (a – b) = a^2 - b^2$

5) $(a + b)^2 = a^2 + 2ab + b^2$

6) $(a – b)^2 = a^2 - 2ab + b^2$

1) Simplify each of the following to the simplest form :

a) $4\sqrt{3} + \sqrt{12} - 2\sqrt{27} + \frac{1}{5}\sqrt{75}$

....

....

b) $\sqrt{50} - 8\sqrt{\frac{1}{2}}$

c) $\sqrt{\frac{2}{3}} - \frac{1}{3}\sqrt{6} + \sqrt{54}$

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d) $\sqrt{(-5)^2} + \sqrt{18} - \frac{6}{\sqrt{2}}$

e) $\sqrt{50} - \frac{10}{\sqrt{2}} + 6\sqrt{0.5}$

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f) $\frac{3\sqrt{2}}{2\sqrt{18}}$

………………………………………………………

………………………………………………………

………………………………………………………

4) If x =] -1 , 5] and y = [3 , 5]

Find in the form of intervals :

***a) x* – y**

………

………

………

b) y - x

………

………

………

5) Complete :

a) If $x^2 - y^2 = 18$ and $x - y = 2\sqrt{3}$, then $x + y =$ ……

b) If $\boldsymbol{x}^2 = \frac{8}{9}$, then $\boldsymbol{x} =$ …….

c) $\sqrt{3} \times \sqrt{6} = 3 \times$ …….

Date:............ **Sheet (8)**

SAMA Language School

The two conjugate numbers

Remember that :

* $(\sqrt{a} + \sqrt{b})$, $(\sqrt{a} - \sqrt{b})$ are said to be conjugate numbers

Ex: . $(\sqrt{3} + \sqrt{2})$, $(\sqrt{3} - \sqrt{2})$

* $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b}) = a - b$

Ex: $(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2}) = 3 - 2 = 1$

1) Complete :

a) $(\sqrt{3} + 2)$ its conjugate is (...............) and their product is (...............)

b) $(\sqrt{6} - 3)$ its conjugate is (...............) and their product is (...............)

c) $(3\sqrt{2} + 2)$ its conjugate is (...............) and their product is (............)

d) If $X^2=5$,then $(X+\sqrt{5})^2$ =………………or ……………..

e) If $\frac{1}{X} = \sqrt{5} - 2$ then the value of X in the simplest form is…………

f) $3\sqrt{2} + \sqrt{8} - \sqrt{18}$ =………………………………

2)choose the correct answer:-

a) $\sqrt{50} - \sqrt{18} - \sqrt{2}$ =…………… ($\sqrt{30}$, $\sqrt{2}$, 2 , $2\sqrt{2}$)

b) $(\sqrt{7} - \sqrt{5})(\sqrt{7} + \sqrt{5})$ =……….. (2 ,12 ,$2\sqrt{7}$, $-2\sqrt{5}$)

c) $(\sqrt{8} + \sqrt{2})^2$ =……………….. ($\sqrt{10}$, 10 ,18 , $\sqrt{18}$)

e)The next number in the pattern :

$\sqrt{3}$, $\sqrt{12}$, $\sqrt{27}$, $\sqrt{48}$ is …… ($\sqrt{50}$, $\sqrt{75}$, $\sqrt{60}$, , $\sqrt{90}$)

3) If $x = \sqrt{5} - 2$ and $y = \sqrt{5} + 2$, find the value of :

a) $x + y$

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b) $x - y$

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……………………………………………………
……………………………………………………

c) $x\,y$

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d) $x^2 - y^2$

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4) If $x = \frac{2}{\sqrt{7}-\sqrt{5}}$ and $y = \sqrt{7} - \sqrt{5}$, Find the value of $(x + y)^2$

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5) If $a = \sqrt{5} - \sqrt{3}$ and $b = \frac{2}{a}$, Find the value of $a^2 + 2ab + b^2$

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6) If $x = 2\sqrt{3} - \sqrt{2}$ and $y = \sqrt{12} + \sqrt{2}$, then :

Find the value of $\frac{x + y}{xy - 2}$

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7) If $x = \frac{1}{\sqrt{3} - \sqrt{2}}$ and y is the multiplicative inverse of x , Find y ,

then prove that $(x + y)^2 = 12$

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8) If $a = \sqrt{3} + \sqrt{2}$ and $b = \sqrt{3} - \sqrt{2}$, prove that each of a and b

is multiplicative inverse of the other .

………

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………

9) If $x = \sqrt{2} - 1$, then find in the simplest form the value of x^{-1}

....

....

....

10) Simplify to the simplest form :-

$$2\sqrt{5} + 6\sqrt{\frac{1}{3}} - \sqrt{12} - 5\sqrt{\frac{1}{5}}$$

....

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....

11) If $X = \sqrt{5} + \sqrt{2}$, $Y = \sqrt{5} - \sqrt{2}$

Find the value of $\frac{X+Y}{XY-1}$ in its simplest form

....

....

....

12) If $A = \sqrt{3} + \sqrt{2}$, $B = \frac{1}{\sqrt{3}+\sqrt{2}}$ find the value of

$A^2 - b^2$ in its simplest form.

....

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13) If $x = \sqrt{7} + \frac{1}{2}\sqrt{12}$ and $y = \frac{1}{3}\sqrt{63} - \sqrt{3}$

Prove that $x^{2}\ y^{2} = 16$

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1) Choose the correct answer from the given ones :

(1) $\sqrt{7} + \sqrt{7}$ = ...

a) $\sqrt{14}$ b) 7 c) $\sqrt{28}$ d) $\sqrt{7}$

(2) The multiplicative inverse of $\frac{\sqrt{5}}{10}$ is ....

a) $-2\sqrt{5}$ b) $2\sqrt{5}$ c) $-\frac{\sqrt{5}}{10}$ d) $\sqrt{2}$

(3) The S.S of the inequality $-1 \leq x - 1 < 0$ in R is ....

a) [0 , 1 [b) [-1 , 0 [c) [-1 , 1[d)]-1 , 0]

(4) If $x \in$ R , then S.S of the equation : $(x^2 + 9)(x^3 + 8) = 0$ is ....

a) Ø b) {3 , -2} c) {3 , -3 , -2} d) {-2}

(5) If $3^{n+1} = 81$, then n = ...

a) 4 b) 3 c) 5 d) 2

(6) $\frac{1}{3}\sqrt{18}$ = ...

a) $\sqrt{2}$ b) $3\sqrt{2}$ c) $2\sqrt{3}$ d) 6

2) Complete :

a) $R_+ - R_-$ = ...

b) If $x = \sqrt{7} + \sqrt{5}$ and $y = \sqrt{7} - \sqrt{5}$, then $x\,y$ = ...

c) If $2^n = \sqrt{3}$, then 4^n = ...

d) [0 , 4] – [0 , 3] = ……….

e) $\frac{1}{(\sqrt{2})^2} + 2^{\text{zero}} - 2^{-1}$ = …………

f) The conjugate number of $\frac{6}{\sqrt{7}+1}$ is ………..

3) Find in the form of an interval using the number line

]-∞ , 2] ∩]1 , 5 [

………

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4) Simplify to the simplest form : $2\sqrt{12} - 3\sqrt{\frac{1}{3}} + \frac{6}{\sqrt{3}}$

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5) If $x = 3 - 2\sqrt{2}$ **and** $y = \frac{1}{3 - 2\sqrt{2}}$**, prove that x and y are two conjugate numbers, then find the value of the expression:** $\frac{(x - y)^2}{xy}$

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6) If $\frac{x}{3 - \sqrt{5}} = 3 + \sqrt{5}$ **, find the value of** x^2

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Operations on the cube roots

Remember that :

* $\sqrt[3]{a} \times \sqrt[3]{b} = \sqrt[3]{ab}$	**Ex:**	$\sqrt[3]{2} \times \sqrt[3]{4} = \sqrt[3]{8} = 2$
* $\sqrt[3]{\frac{a}{b}} = \frac{\sqrt[3]{a}}{\sqrt[3]{b}}$, $b \neq 0$	**Ex:**	$\sqrt[3]{\frac{-1}{1000}} = \frac{\sqrt[3]{-1}}{\sqrt[3]{1000}} = \frac{-1}{10}$
* $\sqrt[3]{-a} = -\sqrt[3]{a}$	**Ex:**	$\sqrt[3]{-4} = -\sqrt[3]{4}$
* $(\sqrt[3]{a})^m = \sqrt[3]{a^m}$	**Ex:**	$(\sqrt[3]{2})^6 = \sqrt[3]{2^6} = 2 \times 2 = 4$
* $a\sqrt[3]{b} = \sqrt[3]{ba^3}$	**Ex:**	$3\sqrt[3]{\frac{1}{9}} = \sqrt[3]{27 \times \frac{1}{9}} = \sqrt[3]{3}$

1) Simplify to its simplest form :

a) $\sqrt[3]{54} + \sqrt[3]{-2} - \sqrt[3]{16}$

....

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b) $-2\sqrt[3]{4} + \sqrt[3]{108} - \sqrt[3]{\frac{1}{2}}$

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c) $\sqrt[3]{3} - \sqrt[3]{4} \times \sqrt[3]{6} + 3\sqrt[3]{\frac{1}{9}}$

....
....
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....

d) $\sqrt[3]{32} + 2\sqrt[3]{\frac{1}{2}} - (\sqrt[3]{-2})^2$

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....
....
....

e) $\sqrt{27} + \frac{1}{3}\sqrt[3]{27} - 9\sqrt{\frac{1}{3}} - 1$

....
....
....

f) $\frac{4}{3-\sqrt{5}} - \frac{1}{2}\sqrt{20} + 2\sqrt[3]{\frac{1}{4}}$

....
....
....

2) Choose the correct answer :

a) $\sqrt[3]{\frac{2}{9}}$ = ... ($\frac{\sqrt[3]{6}}{3}$, $\sqrt[3]{\frac{1}{6}}$, $\sqrt[3]{6}$, $\sqrt[3]{2}$)

b) $(5\sqrt[3]{-5})^2$ = ... ($25\sqrt[3]{5}$, $25\sqrt[3]{-5}$, $-25\sqrt[3]{25}$, 25)

c) $\left(\sqrt[3]{\frac{3}{2}}\right)^y = \sqrt[3]{\frac{2}{3}}$, then y = ... (-1 , 1 , ±1 , zero)

d) $\sqrt[3]{2} + \sqrt[3]{2}$ = ... ($\sqrt[3]{2}$, $\sqrt[3]{4}$, $\sqrt[3]{8}$, $\sqrt[3]{16}$)

e) $\frac{\sqrt[3]{16}}{\sqrt[3]{2}}$ = ... (8 , -2 , 2 , $2\sqrt[3]{2}$)

3) Complete :

a) $\sqrt[3]{3} \times \sqrt[3]{9} = \sqrt{.......}$

b) If $x = (\sqrt[3]{2})^4$ and $y = \sqrt[3]{2}$, then $\frac{x}{y}$ = …………

c) If $x = \sqrt[3]{2} + 1$ and $y = \sqrt[3]{2} - 1$, then $x^2 - y^2$ = ………

d) $a^{-5} + 1 = a^{-5}$ (1 + ……) such that $a \neq 0$

e) $a^r \times a^2 = 1$, then r = ……….

f) If $8\sqrt{8} = a\sqrt{b}$, where a , b are positive integers and a > b ,

then $a \times b$ = ……….

g) If $A = 3^x$, $B = 3^{-x}$, then AB = ……………

h) If $-\sqrt{25} = \sqrt[3]{y}$, then y = ………….

4)prove that :-

$\sqrt[3]{128} + \sqrt[3]{16} - 2\sqrt[3]{54}$ = Zero

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………………………………………………………………………………

5) put each of the following in the form a where a and b are two integers , b is the least positive possible value :-

a) $\sqrt[3]{54}$

…………………………………

…………………………………

b) 3 $\sqrt[3]{\frac{1}{3}}$

…………………………………

…………………………………

c) $\sqrt[3]{-4000}$

…………………………………

…………………………………

5) If a = $\sqrt[3]{5}$ +1 , b= $\sqrt[3]{5}$ -1 find the value of each of the following :-

a) $(a - b)^5$

…………………………………………………………………………

…………………………………………………………………………

…………………………………………………………………………

b) $(a + b)^3$

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Applications on the real numbers

1) Choose the correct answer:

a) The lateral area of a right circular cylinder whose base diameter length (b) and height (h) is .... (πb^2h, πbh, $2\pi rbh$, πbh^2).

b) The cube whose volume is 64 cm^3, has a lateral area = ...cm^2

(96 , 16 , 64 , $12\sqrt{2}$)

c) If the total area of a cube = 96 cm^2 , then the area of one face = ...

(16 cm^2 , 16 cm^3 , 24 cm^2, 48 cm^2)

d) If the edge length of the cube is 2L cm , then its volume = ... cm^3

($4L^3$, $8L^3$, $8L^2$, $12L^2$)

e) The volume of a cube is 5 cm^3 , If the edge length becomes its double , then its volume becomes = ... cm^3 (10 , 20 , 30 , 40)

f)The volume of a sphere whose diameter length is 6 cm =…………cm^3

(288 , 12π , 36π , 288π)

g) The edge length of a cube whose volume is $2\sqrt{2}$ cm^3 =…….cm

($\sqrt{2}$, 2 , 8 , 1.5)

2) If the area of a circle is π cm^2., then find the length of its diameter.

………

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3) If the area of a circle is 2 π cm^2., then find the length of its radius.

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4) The length of the radius of the base of a right circular cylinder = 7cm., and its height equals 25cm., find its lateral area .

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5) If the volume of a right circular cylinder is 90π cm^3. , and its height = 10cm. , then find the length of its radius .

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6) If the volume of a sphere = $\frac{9}{16}\pi$ cm^3. , then find the length of its radius .

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7) Find the length of the sphere whose volume equals the volume of a right circular cylinder of height 18cm. , and the length of the radius of its base = 4 cm.

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8) The lateral area of a cuboid is 480 cm^2, and its base is square shaped with side length 10 cm. , calculate its height .

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9) The dimensions of the base of a cuboid are 9 cm and 10 cm and its height 5 cm . find :-

i) Its volume

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……

ii) Lateral area

……

……

……

iii) Total area

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1) Choose the correct answer :

1) A right circular cylinder is of radius length 3cm. and its height = 5cm.

its volume is ....

a) $15\pi\ cm^3$. b) $75cm^3$. c) $45\pi\ cm^3$. d) $\frac{3}{5}\pi\ cm^3$.

2) $\sqrt{0.5} + \sqrt{0.5}$ = ...

a) $\sqrt{2}$ b) 1 c) $\frac{1}{2}$ d) $\frac{1}{4}$

3) $(2^{-1})^{-2}$ = ... a) 4 b) 2 c) $\frac{1}{2}$ d) $\frac{1}{4}$

4) $\frac{1}{8}$ = ...

a) 0.125% b) 1.25% c) 12.5% d) 125%

5) If $a = \frac{\sqrt{6}}{\sqrt{2}}$, then a = ...

a) $\frac{-\sqrt{6}}{2}$ b) $\sqrt{3}$ c) $\frac{\sqrt{3}}{2}$ d) $\frac{\sqrt{3}}{3}$

6) If $\boldsymbol{x} = \sqrt[3]{2} + 10$ and $y = \sqrt[3]{2} - 10$, then $(\boldsymbol{x} + y)^3$ = ...

a) 2 b) 8 c) 16 d) 18

2) Complete the following :

a) $-\sqrt{25} = \sqrt[3]{\ldots\ldots\ldots}$

b) The circle whose diameter length is $\sqrt{14}$ cm. , its area = …… π cm^2.

c) If the thickness of a sheet of paper is 0.012cm. , then the height of 400 sheets is ……….cm.

d) $\left(\sqrt{5}+\sqrt{4}\right)^7\left(\sqrt{5}-\sqrt{4}\right)^7 = \ldots\ldots\ldots\ldots$

e) $0.05 \times 0.002 = 10^{\cdots\cdots}$

f) $[-1 , 4] - [2 , 7] = \ldots\ldots\ldots$

3) Simplify to the simplest form :

a) $\sqrt[3]{3} - \sqrt[3]{4} \times \sqrt[3]{6} + 3\sqrt[3]{\frac{1}{9}}$.

……

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……

b) $\sqrt{18} - \frac{12}{\sqrt{6}} + \sqrt{2}(2\sqrt{2} - 3)$.

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4) If $a = \frac{2}{\sqrt{7} - \sqrt{5}}$ and $ab = 2$, find in the simplest form the value of the expression : $(a + b)^2$.

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5) A sphere with volume 36π cm^3 is placed inside a cube, if the sphere touches the cube's six faces. Find

a) The radius of the sphere .

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b) The volume of the cube

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6) A metal sphere with diameter 6 cm has got melt and changed into a right circular cylinder with base radius length 3 cm . Find its height .

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7) Find the height of the right circular cylinder whose height is equal to its base radius and its volume is 72π cm^3

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Solving Equations and Inequalities

of first degree in one variable in R

1) Find in R the S.S of the following inequalities , then represent it on the number line :

a) $x - 1 \leq 3 - x$

....

....

....

b) $x - 1 < 5x + 1$

....

....

....

c) $7x - 12 > 5x - 8$

....

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....

d) $2x - 3 < 5x + 9$

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....

....

e) $-5 < x + 3 < 9$

....

....

....

....

f) $5 \leq 3 - x < 7$

....

....

....

....

g) $3 < 2x + 5 \leq 9$

....

....

....

....

h) $3 \leq 3 - 2x \leq 5$

....

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....

....

i) $5 \geq 2 - 3\boldsymbol{x} > -7$

....

....

....

j) $-\boldsymbol{x} < \boldsymbol{x} < 4 - \boldsymbol{x}$

....

....

....

k) $-5 < \boldsymbol{x} + 3 < 9$

....

....

....

l) $2 + 2\boldsymbol{x} \leq 3\boldsymbol{x} + 3 < 5 + 2\boldsymbol{x}$

....

....

....

m) $1 - \boldsymbol{x} \leq 1 - 2\boldsymbol{x} < 3 - \boldsymbol{x}$

....

....

....

n) $3\boldsymbol{x} - 1 \leq 4\boldsymbol{x} - 3 \leq 2\boldsymbol{x} + 5$

....

....

....

o) $\boldsymbol{x} + 3 > 2\boldsymbol{x} - 1 \geq \boldsymbol{x} - 3$

....

....

....

p) $0 \leq \frac{-2\boldsymbol{x} + 6}{3} < 4$

....

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q) $4X \leq 5X+2 < 4X+3$

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r) $X-1 < 3X-1 \leq X+1$

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....

2) Complete :

a) The S.S of the inequalities $-x + 1 \leq 0$ in **R** is …….

b) If $7 - x < 1$, then $x >$ …….

c) If $[-4, \infty[$ is the S.S of the inequalities $-x \leq b$, then b = ……

d) If $]-1, 4]$ is the S.S of the inequalities $a \geq x > -1$, then a = …..

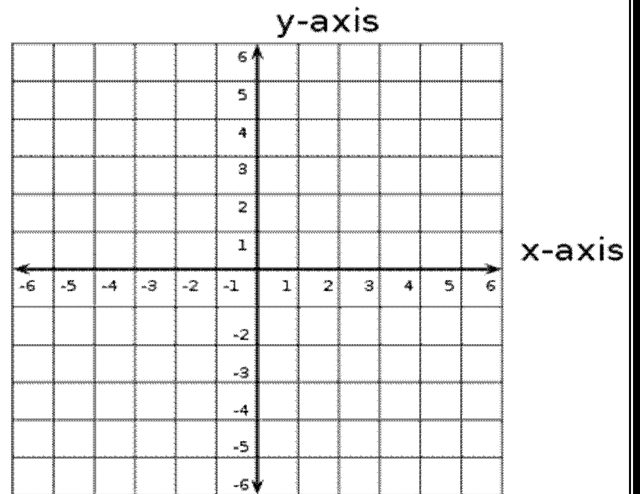
[1] Find four ordered pairs satisfy each linear relation and represent it graphically:

a) x + y = 3

....

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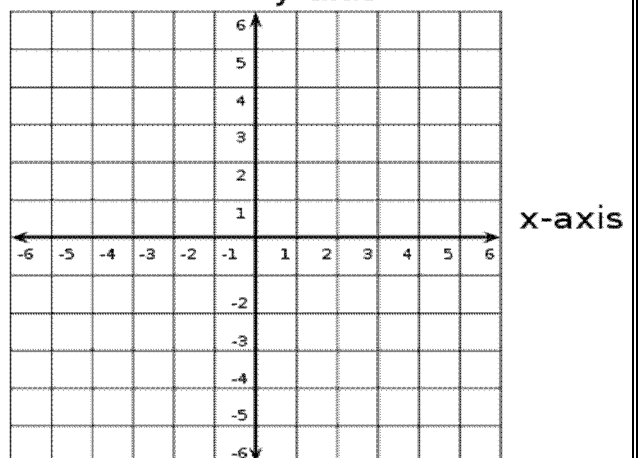
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b) x - 2y = 5

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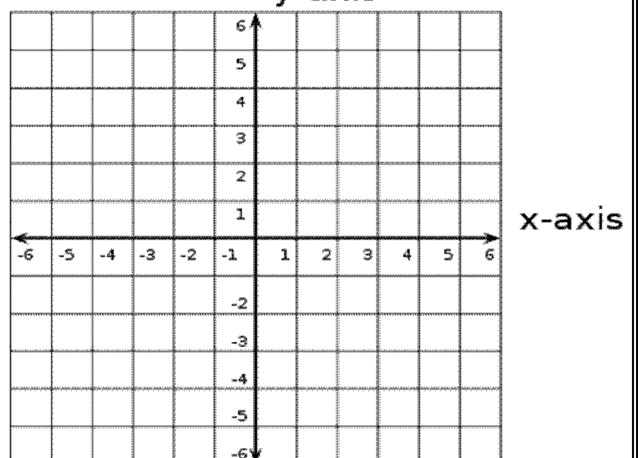
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c) y = 2

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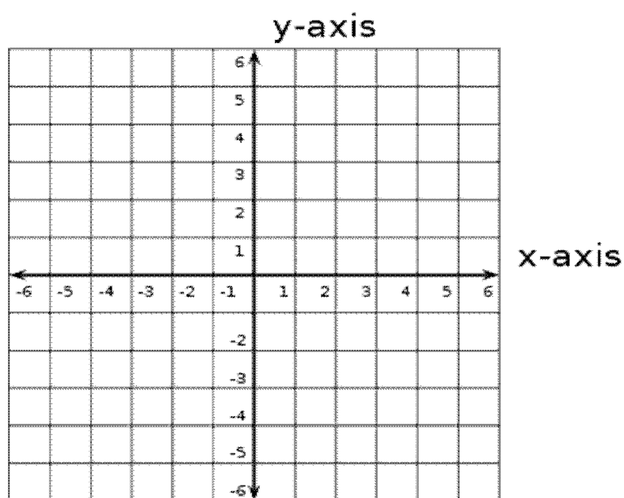


d) x = 1

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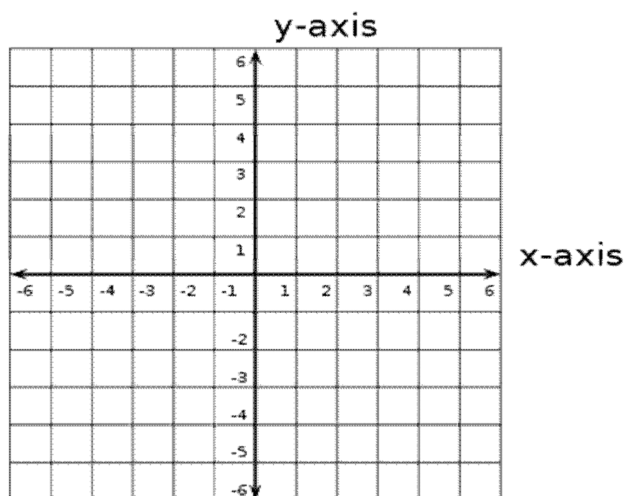


e) x – y = 1

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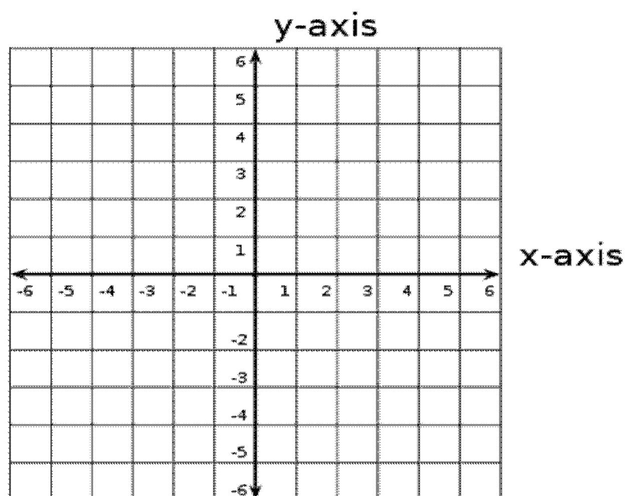


f) x + 2y = 3

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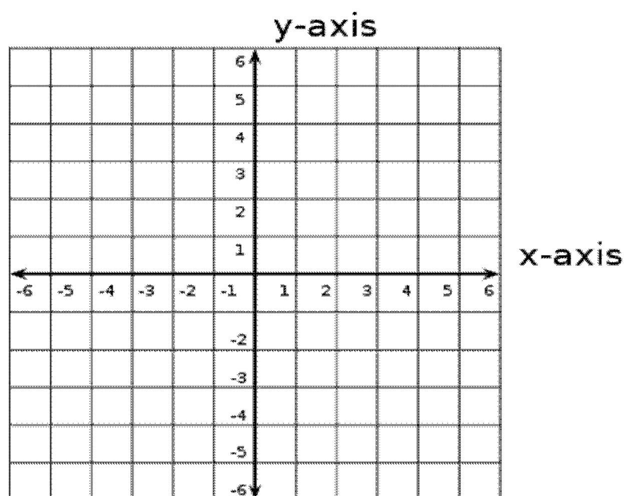
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g) 2x – y = 2

……………………………………………

……………………………………………



1-Choose the correct answer from those given:

1) If $(2, -5)$ satisfies the relation $3x - y + c = 0$, then $c = ...$

a) 1　　b) -1　　c) 11　　d) -11

....

....

2) Which of the following ordered pairs satisfies the relation $2x + y = 5$?

a) $(-1, 3)$　　b) $(1, 3)$　　c) $(3, 1)$　　d) $(2, 2)$

....

....

3) $(3, 2)$ does not satisfy the relation ....

a) $y + x = 5$　　b) $3y - x = 3$

c) $y + x = 7$　　d) $x - y = 1$

....

....

4) The point $(3, 5)$ lies on the straight line which represents the relation ....

a) $y = 3x - 5$　　b) $2x - y = 1$

c) $3x + y = 1$　　d) $y = 3x - 1$

5) If (-1 , 5) satisfies the relation $3x + ky = 7$,then k = ……

a) 2 b) -2 c) 1 d) 10

………

………

6) The relation which expresses the two ordered pairs (2 , 1) and (4 , 3) together is ………

a) $y = \frac{1}{2}x$ b) $y = 2x - 5$

c) $y = x - 1$ d) $y = 3x + 3$

………

………

7) The relation $3x + 8y = 24$ is represented by a straight line intersecting y-axis at the point ………

a) (0 , 8) b) (8 , 0) c) (0 , 3) d) (3 , 0)

………

………

8) The relation $2x + 7y = 14$ is represented by a straight line intersecting x-axis at the point ………

a) (2 , 0) b) (0 , 2) c) (7 , 0) d) (0 , 7)

………

1) Find the value of b, where (-3,2) satisfies the relation:

$3x + by = 1$

....

....

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2) Find the value of k, where (k,2k) satisfies the relation:

$x + y = 15$

....

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3) Graph the relation $2x + 3y = 6$. If the straight line representing this relation intersects the x-axis in point A and the y-axis in point B. Find the area of the triangle OAB, where O is the origin.

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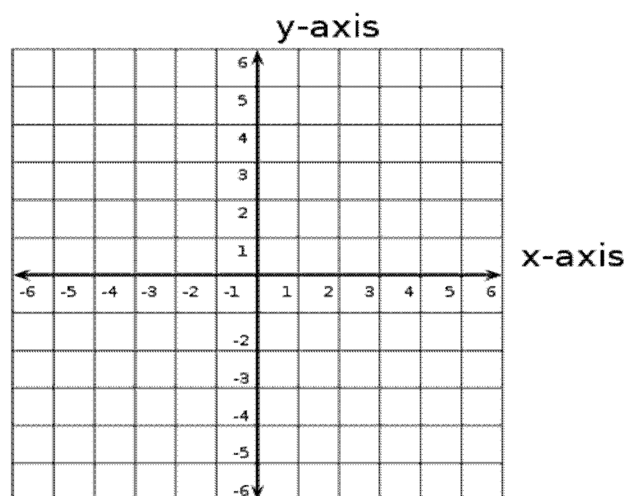
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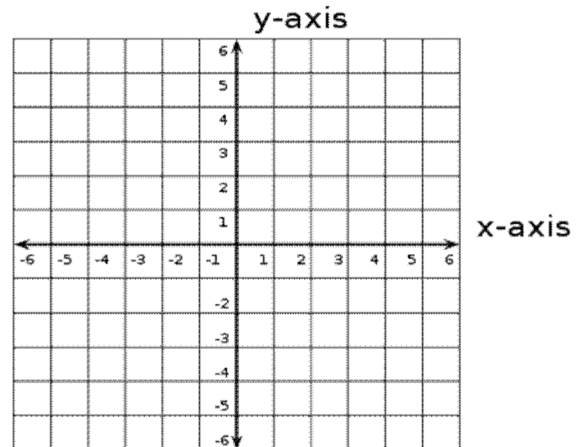
[1] Find the slope of $\overleftrightarrow{AB}$ If :

A = (-1 , 1) and B = (2 , 3).

....

....

Notice that the Slope is ....



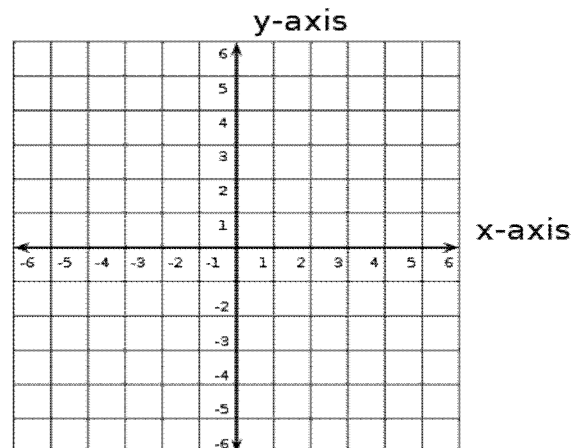
[2] Find the slope of $\overleftrightarrow{XY}$ If :

X = (0 , 2) and Y = (2 , 1).

....

....

Notice that the Slope is ....



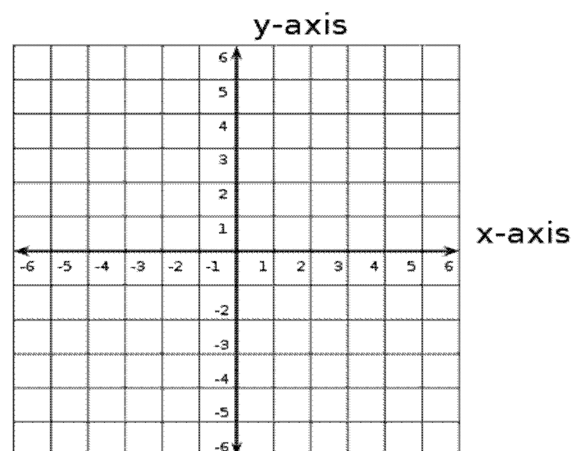
[3] Find the slope of $\overleftrightarrow{AB}$ If :

A = (2 , 1) and B = (2 , 3).

....

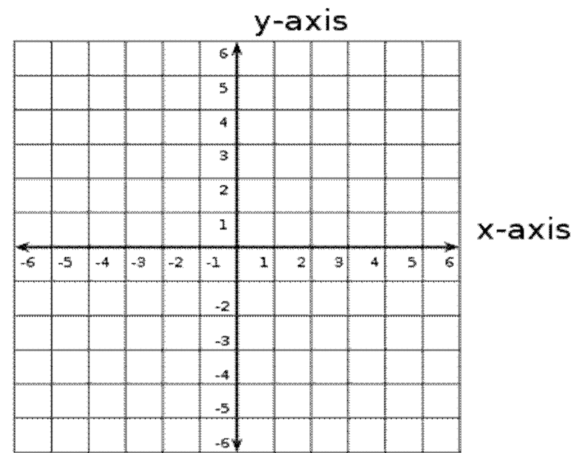
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Notice that the Slope is ....



[4] Find the slope of $\overleftrightarrow{XY}$ If :

X = (-1 , 2) and Y = (3 , 2).



....

....

Notice that the Slope is ....

<u>1-Complete the following</u>:

1- The slope of any horizontal straight line equals ………

2- The slope of any straight line parallel to y – axis is ………

3- The straight line whose slope = zero is parallel to ………

4- If A,B C are collinear then the slope of $\overleftrightarrow{AB}$ = the slope of ………

<u>2- Find the slope of the straight line passing through the two points in each of the following</u>:

1- A (1 , 3) , B (3 , 4)

……………………………………………………………………………………………………

……………………………………………………………………………………………………

2- A (-3 , 2) , B (-6 , 5)

……………………………………………………………………………………………………

……………………………………………………………………………………………………

3- A (1 , -3) , B (2 , -3)

……………………………………………………………………………………………………

……………………………………………………………………………………………………

4- A (3 , -1) , B (3 , 2)

……………………………………………………………………………………………………

5- A (-1 , 3) , B (2 , 1)

……………………………………………………………………………………………

6- E (-3 , -1) , O (0 , 0)

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4- In each of the following, prove that the points A , B and C collinear:

1- A (1 , 1) , B (2 , 2) , C (-3 , -3)

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2- A (4 , -3) , B (-6 , 7) , C (5 , -4)

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3- A (-2 , 12) , B (2 , 4) , C (6 , -4)

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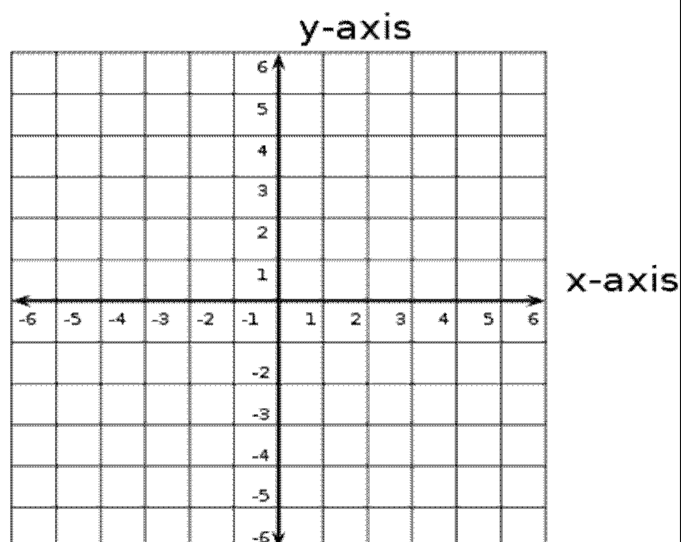
[B] Graph the relation:

$x - 2y = 1$,

state the slope of its straight line and write its type.

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The real-life applications on the slope

1) A car moves with uniform velocity such that it covers 180 km per 3 hours. If the car moves for 5 hours, what is the covered distance.

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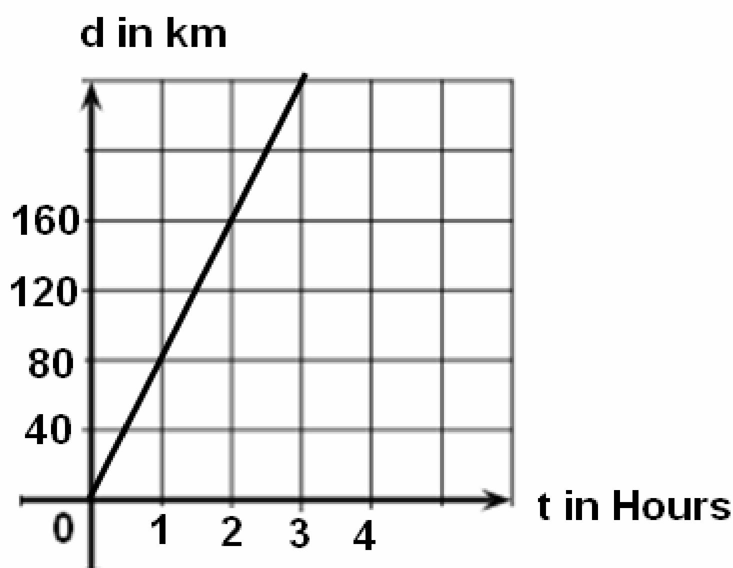
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2) The opposite diagram represents the motion of a car moving with uniform velocity.

a) Determine the velocity of the car.

b) Find the covered distance (in m) after 1.5 hours.

c) Find the slope of the line.



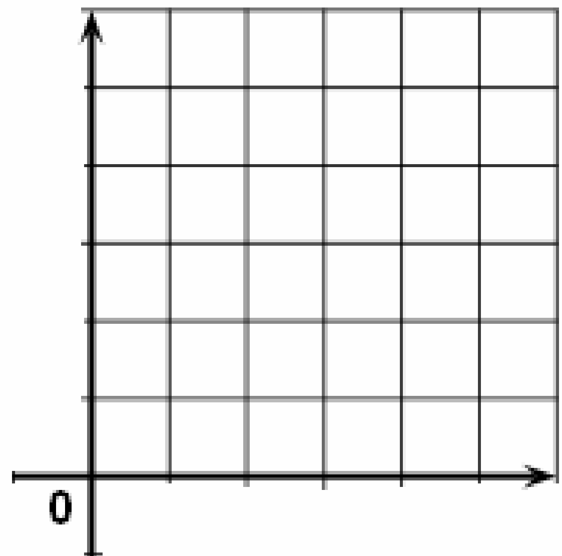
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3) Ali filled up the 40 Liters the tank of his car. As covered a distance of 100 km, the fuel indicator shows the rest of fuel is ½ of the tank. Draw a diagram to show the relation

between the amount of fuel remaining in the tank and the distance covered. What is the covered distance as the tank is getting totally empty?



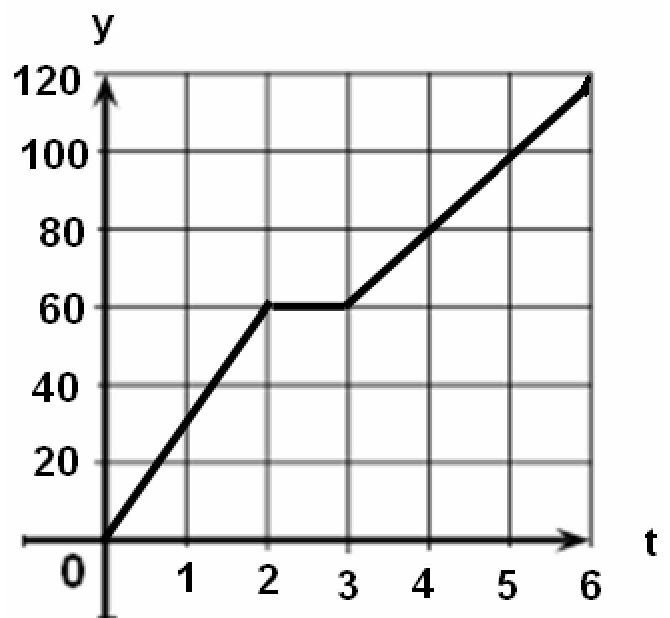
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4) A person read a book. The opposite graph shows the relation between the time (t) in hours and the number of pages (y).



a) Find the rate of reading in first 2 hours.

b) Find the slope at third hour. What does that mean?

c) Find the total rate of reading

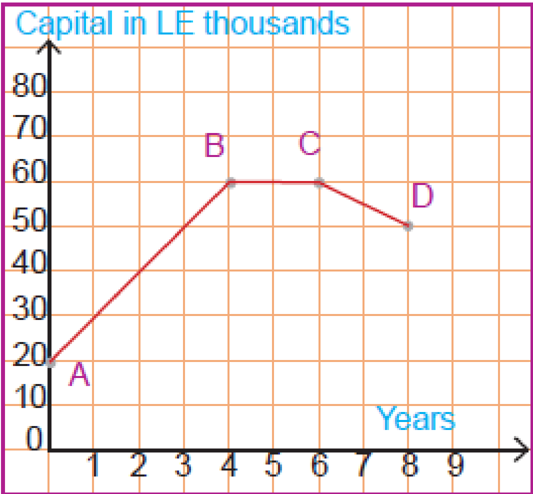
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5) The opposite figure shows the capital change of a company during 8 years:



1- Find the slope of each of $\overleftrightarrow{AB}$, $\overleftrightarrow{BC}$ and $\overleftrightarrow{CD}$. What is the meaning of each?

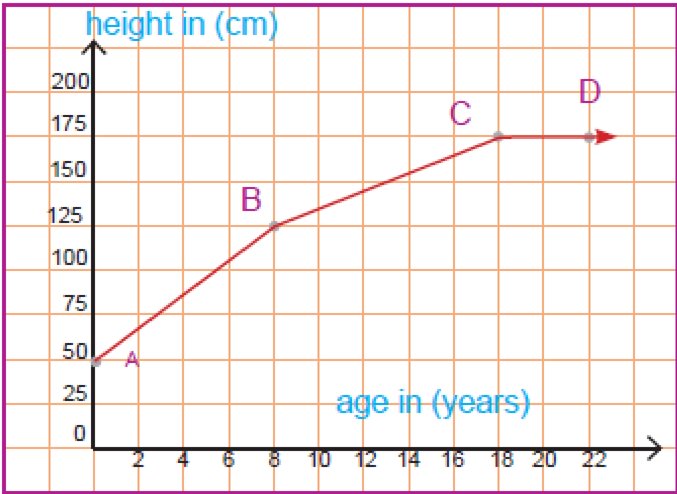
2- Find the starting capital of the company.

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6) The opposite figure shows the relation between the height of a person (in cm) and his age (in year)



1) Find the slope of AB , BC and CD.

Date:………… **Sheet (20)** SAMA Language School

1) Complete:

a) The relation X = 4 is represented graphically by a straight line parallel to ……………… and perpendicular to ………………… and cut ………… axis at the point (…… , ……).

b) The relation Y = -2 is represented graphically by a straight line parallel to ……………… and perpendicular to ………………… and cut ………… axis at the point (…… , ……).

c) The relation X = -1 is represented graphically by a straight line parallel to ……………… and apart ……… units from ………… axis in the …………………… direction.

d) The relation Y = 3 is represented graphically by a straight line parallel to ……………… and apart ……… units from ………… axis in the …………………… direction.

e) The S.S. of the equation $2x^2 - 5x - 3 = 0$

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2) Complete:

a) The slope of any line parallel to X-axis is ....

b) The slope of any line parallel to Y-axis is ....

c) The slope of any line perpendicular to X-axis is ....

d) The slope of any line perpendicular to Y-axis is ....

e) If (2 , 2) satisfies the relation 3x + k y = 2, then k = ...

....

f) If A (3 , 4) and B (-2 , -1) , then slope of $\overleftrightarrow{AB}$ = ...

....

g) IF X , y , Z are collinear , then the slope of $\overleftrightarrow{XY}$ = the slope of ....

h) The ordered pair (3 , …) satisfies the relation 4x - y = 2

....

i) The ordered pair (… , -1) satisfies the relation x - y = 0

....

j) The line represented by the relation 4x – y = 1 cut Y-axis at the point (……… , ………)

....

k) The line represented by the relation x + y = 2 cut X-axis at the point (……… , ………)

....

L) If A (-6 , 7) , B (-1 , -2) , C (0 , 4) then :

The slope of $\overleftrightarrow{AB}$ = ……………

The slope of $\overleftrightarrow{BC}$ = ……………

The slope of $\overleftrightarrow{AC}$ = ……………

M) If the ordered pair (1,3) satisfies the relation $y = 2x + c$, then c = ………

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N) The relation: $2x = 3$ is represented by a straight line parallel to ……… axis.

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O) If $x - y = 3$ and $x + y = 5$, then $x^2 - y^2$ = ………

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<u>3) Choose the correct answer from those given ones</u>:

1- If A (1 , 3) , B (3 , 6) , then the slope of $\overleftrightarrow{AB}$ = ………

a) $\frac{3}{2}$ **b)** $-\frac{1}{4}$ **c)** $\frac{1}{4}$ **d)** $-\frac{2}{3}$

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2- (3 , 2) does not satisfy the relation

a) $y + x = 5$ **b)** $3y - x = 3$ **c)** $y + x = 7$ **d)** $y - x = -1$

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3- The relation: 2x + 5y = 10 is represented by a straight line intersecting y= axis at the point ………

a) (5 , 0) b) (0 , 5) c) (2 , 0) d) (0 , 2)

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4- The S.S. of the equation: $x^2 = 2x$ in R is ………

a) (0) b) (2) c) (0 , 2) d) (-2 , 0)

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5- Which of the following ordered pairs satisfies the relation: $2x + y = 5$?

a) (-1 , 3) b) (1 , 3) c) (3 , 1) d) (2 , 2)

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6- If the slope of the straight line passing through the two points (2 , k) , (1 , -2) equals 3, then k = ………

a) 1 b) -1 c) 3 d) -3

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Unit (2)

Statistics

Statistics

Collecting and Organizing data

1) Below are the scores of 30 students in an examination:

17	10	14	4	15	18	16	17	13	12
12	9	8	18	6	10	15	12	13	9
5	14	19	7	9	14	20	13	8	16

Form the frequency table with sets that represents that data

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2)The following are the scores of 30 students in amonthly math exam.

25	35	40	20	30	37	40	22	33	38
35	36	28	37	39	28	32	26	29	37
23	34	35	36	29	38	40	35	37	31

a)From a frequency table with sets for these scores

b)Find the total number of excellent student . The excellence rate is 36 marks or more.

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3) The following table shows the frequency distribution for the heights of 100 students in a school in centimeters.

Tall (sets) in cm	115-	120-	125-	130-	135-	140-	145-	Total
Number of students (frequency	8	12	19	23	18	13	7	100

a) How many students are with height less than 115cm?

b) How many students are with height less than 135cm?

c) How many students are with height less than 145cm?

Form the ascending cumulative frequency table for these data and represent them graphically.

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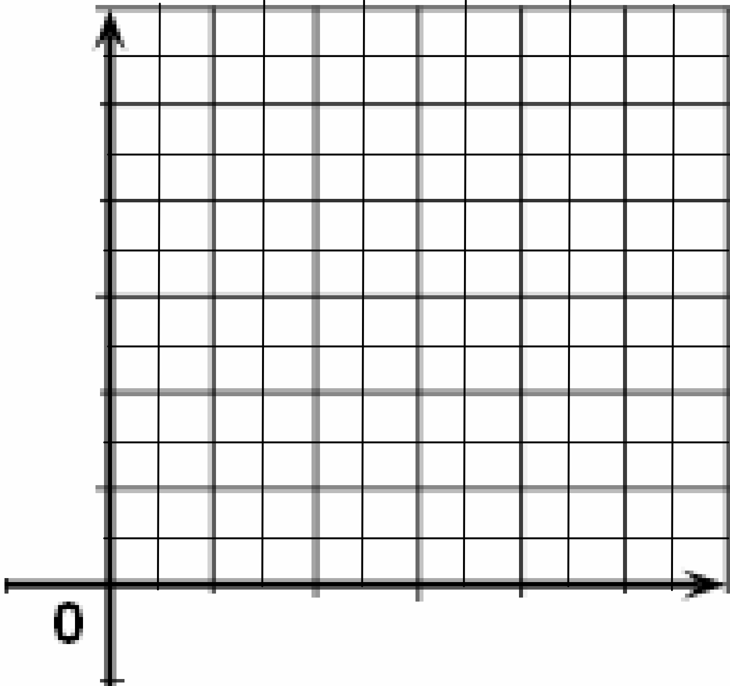
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4) The following table shows the frequency distribution of the scores of 1000 students in a final year exam.

Percentages	20-	30-	40-	50-	60-	70-	80-	90-	Total
Number of students	20	80	140	160	220	150	120	110	1000

Required:

a) Graph the ascending and descending cumulative frequency curves.

b) Find the number of students whose scores are less than 55 marks.

c) Find the number of students whose scores are more than 75 marks.

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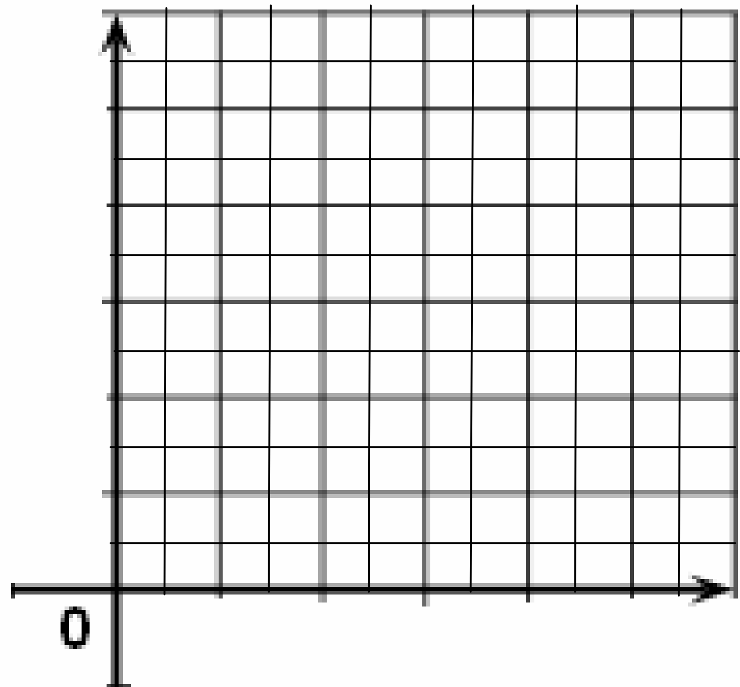
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5)The following table shows the frequency distribution of the scores of 100 students in a final year exam.

Sets	0-	10-	20-	30-	40-	50-	Total
Frequency	8	14	15	28	28	23	100

a)Form both the ascending and descending cumulative frequency tables and graph them in the same graph paper.

b)From the graph , find the number of students who got less than 40 marks and those who got 40 marks and more.

c)Find the percentage of success, given that the minimum mark of success is 20 marks.

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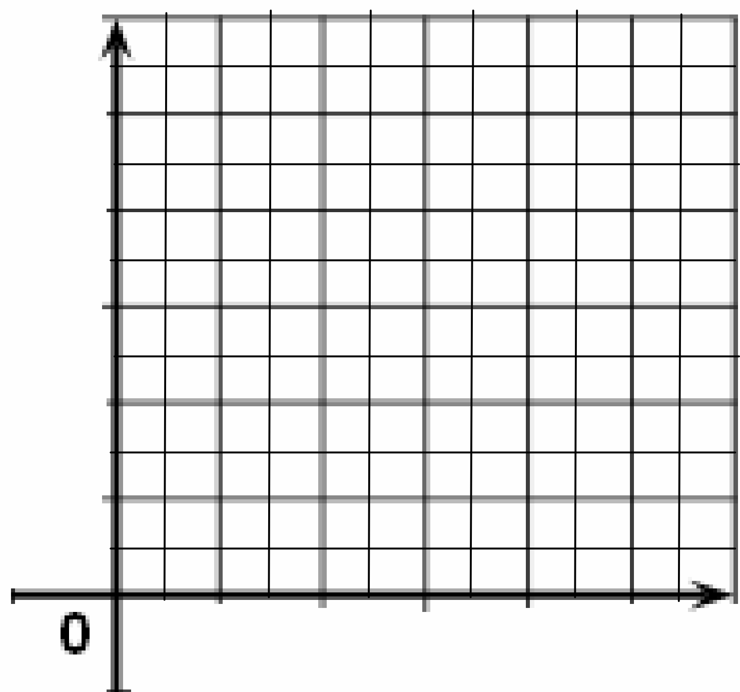
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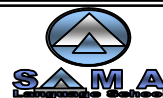
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Sheet (22)



Arithmetic Mean

1) Find the mean of following frequency distribution table :

Sets	5 -	10 -	15 -	20 -	25-	30 -	35 -	Total
frequency	2	4	7	9	4	3	1	30

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2) The following table shows the frequency distribution of marks of 30 students in algebra exam :

Sets	5 -	15 -	25 -	35 -	45-	**Total**
frequency	3	4	8	x	6	30

a) Find the value of x.

b) Find the arithmetic mean.

c) Find the number of students whose marks are less than 25 marks.

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3) The following table shows the frequency distribution of marks of 40 students in one exam :

Sets	5 -	15 -	......	35-	45 -	**Total**
frequency	3	......	12	10	5	40

a) Complete the table.

b) Calculate mean.

c) Find the number of students whose marks are less than 35 marks.

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Median

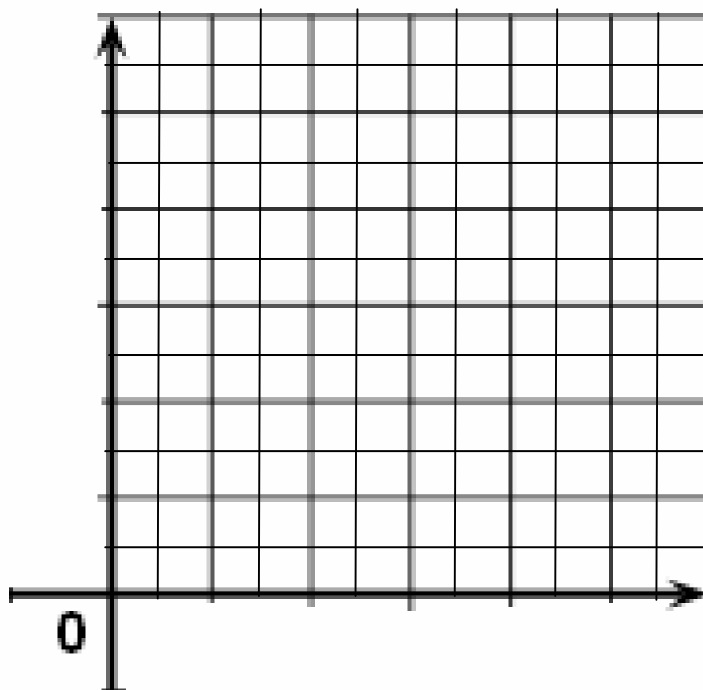
1) Complete:

a) The order of the median of a set of the set values : 7 , 6, 5 , 8 and 4 is ……
b) If the order of the median of a set of values is fourth, then the number of the values equals …………….
c) If the median of a set of the values : k+1 , k+2 , k+5 , k+4 and k+3 where k is a positive integer is 13 then k=…..
d) The mean of the values 7 , 15 , 19 ,14 and 15 is ……..
e) The point of intersection of the ascending and descending cumulative frequency curves determines …….on the axis of sets.
f) If the mean of the marks of 3 pupils is 12 then the total of their marks is……

2) By using the ascending cumulative frequency curve, find the median of following frequency distribution:

Sets	0 -	2 -	4 -	6 -	8-	**Total**
frequency	2	3	7	6	2	20

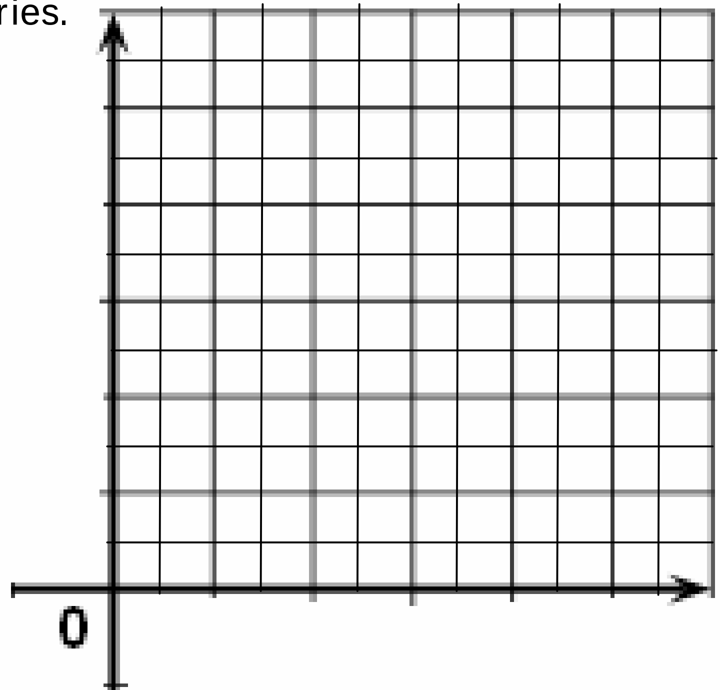
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3) The following table shows the frequency distribution of 100 factories according to the number of weekly working hours:

Sets	50 -	60 -	70 -	80 -	90-	**Total**
frequency	6	14	48	22	10	100

Using the dscending cumulative frequency curve, find the median number of hours of work of these factories.



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4) The following table shows the frequency distribution of marks of 60 students in one exam :

Sets	5 -	10-	15 -	20-	25-	35-	45 -	**Total**
frequency	3	5	10	12	15	10	5	60

Find the median mark.

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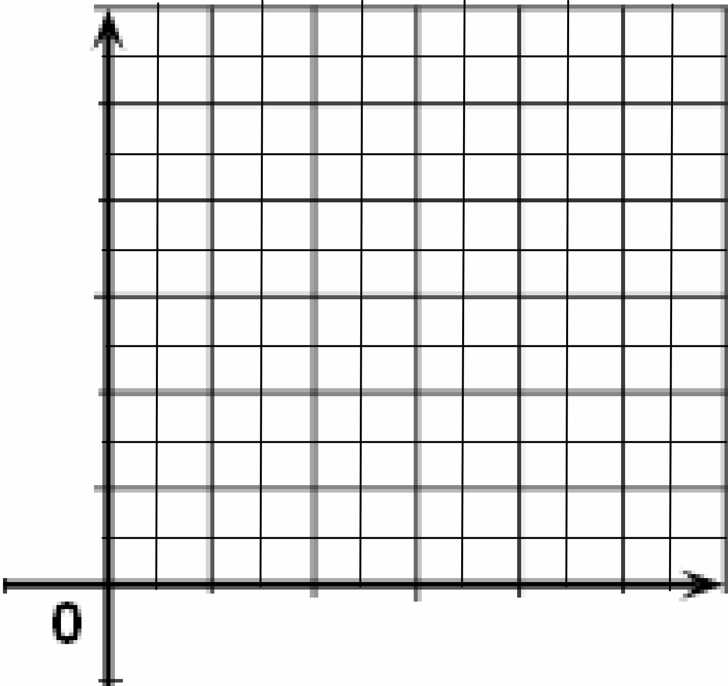
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Date:…………

Sheet (24)

SAMA Language School

Mode

1) Complete:-

a) The mode of the values : 5, 3 , 8 ,5 ,9 is ……

b) The mode of the values : 8 ,7, 8 , 7, 6 ,5 ,8 is …….

c) If the mode of the values : 4 , a , 5 , 3 is 3 then a=……

d) If the mode of the values :12 , 7 , x+1 , 7 , 12 is 7 then x=…….

e) If the mode of the values : 4 , 11 , 8 and 2 is 4 then x=…..

f)If the lower limit of a set is 8 and the upper limit of the same set is 14 , then its center is ………

g)If the lower limit of a set is 4 and its center is 9 ,then its upper limit is …………..

h)The location of the top of the frequency curve on the set axis is…………

2) The following table shows the frequency distribution of marks of 100 students in an exam :

Sets	10 -	14 -	18 -	22 -	26-	**Total**
frequency	5	15	20	40	20	100

Find the mode mark using the histogram of this distribution.

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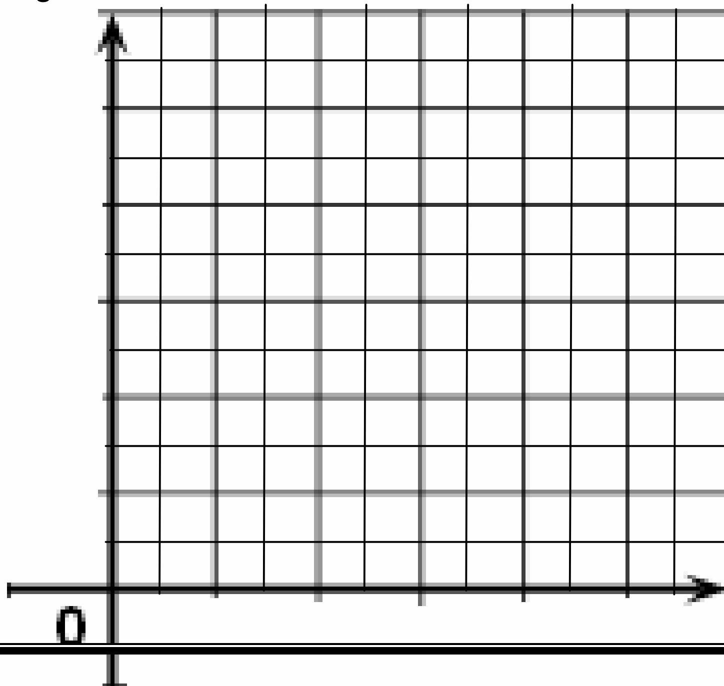
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3) The following table shows the frequency distribution of 100 workers in one of the factories according to their daily wages:

Sets	20 -	25 -	30 -	35 -	40-	**Total**
frequency	12	18	40	20	10	100

Draw the histogram of this distribution, then find the mode wage of the worker.

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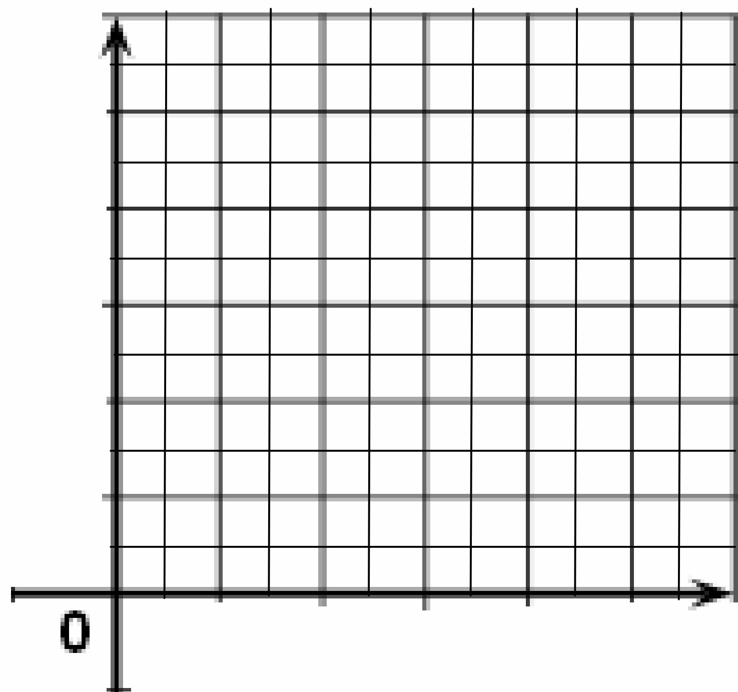
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3) The following table shows the frequency distribution of ages of 45 persons:

Sets	12 -	14-	16 -	18-	20-	22-	24 -	**Total**
frequency	5	7	8	12	6	4	3	45

Find the mode age.

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